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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/675,207	09/30/2003	Kevin Lancon	Flowserve C-94	9935
23474	7590	10/05/2004	EXAMINER	
FLYNN THIEL BOUTELL & TANIS, P.C. 2026 RAMBLING ROAD KALAMAZOO, MI 49008-1699			PRUCHNIC, STANLEY J	
			ART UNIT	PAPER NUMBER
			2859	

DATE MAILED: 10/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary	Application No. 10/675,207	Applicant(s) LANCON ET AL.	
	Examiner Stanley J. Pruchnic, Jr.	Art Unit 2859	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>6/28/04(2sheets)</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Preliminary Amendment Status

1. The preliminary amendment (***Not Entered***) to the Specification filed on 30 September 2003 (in the Transmittal Papers) does not comply with the requirements of 37 CFR 1.121(h), which states "Each section of an amendment document (e.g., amendment to the claims, amendment to the specification, replacement drawings, and remarks) must begin on a separate sheet."

In order to expedite prosecution, this "informal" amendment has been considered "Not Entered". Please resubmit the amendment with your response to this Office Action.

Priority

2. Applicant has not complied with one or more conditions for receiving the benefit of an earlier filing date under 35 U.S.C. 119(e) as follows:

An application in which the benefits of an earlier application are desired must contain a specific reference to the prior application(s) in the first sentence of the specification or in an application data sheet (37 CFR 1.78(a)(2) and (a)(5)). The specific reference to any prior nonprovisional application must include the relationship (i.e., continuation, divisional, or continuation-in-part) between the applications except when the reference is to a prior application of a CPA assigned the same application number.

Oath/Declaration

3. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application, by application number and filing date, is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

The full name of each inventor (family name and at least one given name together with any initial) has not been set forth.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over **El-Ibiary** (U. S. Patent No. 6,331,823 B1) in view of **Smith et al.** (U. S. Patent No. 6,271,761 B1, hereinafter **Smith**).

El-Ibiary (6331823 B1) discloses a method for monitoring operating conditions on rotating equipment, including a rotating shaft 24, bearings 32, providing a plurality of temperature data collectors (each comprising a local transmitter comprising a printed circuit card 34; providing data to an external processor; Col. 5, Lines 21-50), each having a temperature sensor 44 positioned at temperature sensing locations, each detecting surface temperatures on said rotating equipment by temperature readings of said sensing locations through said temperature sensor, and storing temperature data from each said temperature reading in said data collector, wherein temperature readings of each temperature sensor 44 indicates an operating temperature of said associated bearing; repeating (sequentially; Col. 2, Lines 1-11) said data collection procedure periodically over time; analyzing said temperature data (trend line analysis;

Col. 3, Lines 38-43) to identify temperature increases in said rotating equipment indicating abnormal operating conditions of said bearings (overheating, Col. 1, Lines 15-19) as claimed by Applicant in Claim 1. Further regarding Claims 2-4: EL-IBIARY discloses reference temperature data is defined by said temperature data of at least one prior said data collection procedure, as is well known for "trend" data analysis, this requires a plurality of said prior data collection procedures are performed to generate reference temperature data, which is the earlier collected data. The prior data collection procedure defined by one said data collection procedure performed immediately prior to said last data collection procedure in order to comprised the minimum required number of procedures to be considered a trend.

EL-IBIARY, to summarize, discloses all the limitations as claimed by Applicant in Claims 1-4, as described above, except EL-IBIARY does not explicitly disclose manually positioning a temperature sensor as claimed by Applicant.

SMITH discloses a temperature sensor assembly 10 intended for the same purpose of sensing temperature of bearings in rotating equipment, but SMITH further discloses the sensor includes threads adapted for cooperating with existing grease fittings, which are used for lubricating the bearings, a process including manually attaching the sensor by detachably mounting the sensor into the available grease fitting location.

SMITH further discloses and suggests that it is advantageous to manually position the threaded temperature sensors in the pre-existing grease fittings in order to benefit from the already available location close to the bearing.

SMITH is evidence that ordinary workers in the field of rotating machine maintenance would recognize the benefit of manually detachably mounting the sensor into the already available fittings as taught by SMITH for the fixed positions of EL-IBIARY in order to not have to provide any additional mounting holes and to get close to the bearing in order to more accurately measure its temperature.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute the manually attachable/detachable sensor for the fixedly positioned sensors of EL-IBIARY in order to get close to the

bearing in order to more accurately measure its temperature without having to provide any additional mounting holes as taught by SMITH.

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over El-Ibiary in view of SMITH and further in view of Milek *et al.* (U. S. Patent No. 6,208,953 B1, hereinafter MILEK).

Regarding Claim 5: El-Ibiary in view of SMITH, to summarize, discloses or suggests all the limitations of the method as claimed by Applicant in Claim 5, as described above in Paragraph 6 as applied to Claims 1-4, except for the environment of intended use, as claimed in Claim 5, wherein said rotating equipment further includes a process fluid and a primary seal arrangement preventing leakage of said process fluid along said shaft, said seal arrangement including passages therein containing a seal fluid. El-Ibiary already disclosed said sensing locations being defined on said bearings.

Neither El-Ibiary nor SMITH explicitly disclosed said sensing locations being defined on a seal arrangement, the equipment further including a process fluid and a primary seal arrangement preventing leakage of said process fluid along said shaft, said seal arrangement including passages therein containing a seal fluid as claimed by Applicant in Claim 5. The use of "and/or" in Claim 5, regarding said seal passages, does not require the sensing locations to be defined to be on said seal passages, but only that if they are so defined, each said sensing location associated with a said seal passage will, in normal usage, be indicating a temperature of said seal fluid, because of its proximity thereto.

MILEK discloses in a method for monitoring plants with components including bearings and seals and process fluids, the use of temperature monitoring methods for both shaft bearings and/or seals (Col. 5, Line 6).

MILEK further discloses that it is advantageous to monitor both bearings and seals in order to benefit from a more accurate model prediction of wear by using more parameters (Col. 5, Line 66 - Col. 6, Line 17).

MILEK is evidence that ordinary workers in the field of predictive plant maintenance would recognize the benefit of using either bearings or seals or both as

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taught by MILEK for the bearing of El-Ibiary in order to benefit from a more accurate predictive model of a wearing out of a plant.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the method of El-Ibiary in a plant including bearings and seals in order to more accurately predict wear in that plant as taught by MILEK.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art cited in a form PTO-892 and not mentioned above disclose related temperature measurement devices and methods.

- Schick *et al.* (US 6,584,434 B1) relates to data filtering and anomaly detection, and more particularly to improved change-detect data compressing using a rolling average of the data as a low pass filter and mode based statistical process control for anomaly detection.
- Libert (US 4,796,142 A1), in a system for thermal overload protection, uses a filtered time lag, a running sum, for smoothing out trend data.
- The other prior art teach equivalence of methods using vibration and temperature and in rotating machinery including bearings.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stanley J. Pruchnic, Jr., whose telephone number is **(571) 272-2248**. The examiner can normally be reached on weekdays (Monday through Friday) from 7:30 AM to 4:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego F. F. Gutierrez can be reached at **(571) 272-2245**.

The **Official FAX** number for Technology Center 2800 is **(703) 872-9306** for **all official communications**.

Any inquiry of a general nature or relating to the status of this application or proceeding may be directed to the official USPTO website at <http://www.uspto.gov/> or you may call the **USPTO Call Center** at **800-786-9199** or 703-308-4357. The Technology Center 2800 Customer Service FAX phone number is (703) 872-9317.

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The cited U.S. patents and patent application publications are available for download via the Office's PAIR. As an alternate source, all U.S. patents and patent application publications are available on the USPTO web site (www.uspto.gov), from the Office of Public Records and from commercial sources.

Private PAIR provides external customers Internet-based access to patent application status and history information as well as the ability to view the scanned images of each customer's own application file folder(s).

For inquiries relating to Patent e-business products and service applications, you may call the **Patent Electronic Business Center (EBC)** at **703-305-3028** or toll free at **866-217-9197** between the hours of **6 a.m. and midnight Monday through Friday EST**, or by e-mail at: ebc@uspto.gov. Additional information is available on the Patent EBC Web site at: <http://www.uspto.gov/ebc/index.html>.



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Stanley J. Pruchnic, Jr.
9/29/04